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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/764,467	01/17/2001	Gregg J. Armezzani	END919980055US3	8919

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IBM Corporation / IP Law N50/040-4
1701 North Street
Endicott, NY 13760

EXAMINER

VIGUSHIN, JOHN B

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 10/04/2002

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/764,467

Applicant(s)

ARMEZZANI ET AL.

Examiner

John B. Vigushin

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. The present Application is a continuation of parent US Appln. Ser. No. 09/282,842, filed on March 31, 1999, now US Patent No. 6,198,634 B1. The Examiner has reviewed all the prior art cited or relied upon in the above-mentioned parent Application during the examination of the instant Application, as required by the MPEP § 2001.06(b). The Examiner acknowledges the cancellation of Claims 1-25 and the addition of new Claims 26-31 by the Preliminary Amendment filed with the instant Application as Paper No. 2 on Application filing date January 17, 2001. A first action on the merits of Claims 26-31 follows below.

Specification

2. The disclosure is objected to because of the following informalities:

In the Specification:

p.6, line 18: change "benzatriazole" to --benzotriazole--; and change "Benzatrizaole" to --Benzotriazole--.

Appropriate correction is required.

Claim Objections

3. Claim 26 is objected to because of the following informalities:

On line 18: change "benzatriazole" to --benzotriazole--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 26-31 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

On p.6, lines 13-15 of the Specification, the Applicant discloses that conductive metallic layers lining the substrates are "comprised of a metallic material such as copper, nickel, gold chromium, solder, alloys of solder or combinations of these metals." The Applicant further teaches, in lines 17-18 of p.6, that "[w]hen the conductive layers...are comprised of copper, the protective layer is usually a layer of benzotriazole [sic], chlorite, or immersion tin" and goes on to explain the applications of these materials to copper in lines 18-23 of p.6. It is clear that benzotriazole, chlorite and immersion tin are applicable to copper and to alloys that are predominantly composed of copper. However, these above-mentioned protective layers are evidently not applicable to embodiments of the invention wherein the aperture metallizations are not copper; e.g., nickel, gold, chromium or solder, as disclosed. No disclosure has been made of any contemplated protective layer for those non-copper metals.

Claim 26 recites in lines 9-10 that the conductive metallic layer of the substrate apertures is "selected from the group consisting of copper, nickel, gold, chromium solder and alloys thereof." In lines 15-19, Claim 26 recites that said conductive metallic layer includes "a protective layer thereon, said protective layer selected from the group consisting of benzotriazole [sic], chlorite, and immersion tin." However, these protective layers are enabled **only for the case, as claimed, where the aperture metallic layer is comprised of copper** and evidently not enabled for the case, as claimed, when the aperture metallic layer is comprised of nickel, gold, chromium or solder. Therefore, the claim is non-enabling as a whole since the protective layers benzotriazole, chlorite and immersion tin are supported in the disclosure as only utilized in the case of copper apertures and evidently not for use on the other claimed non-copper aperture metallization limitations.

6. Claims 27-31 depend from rejected Claim 26 and therefore inherit the defects of the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 26-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Bindra et al.

As to Claim 26, Bindra et al. discloses: a first circuitized substrate (Fig. 4A) having at least one conductive aperture 8 therein having an external (bottom) surface (Fig. 4A); a second circuitized substrate 11 having at least one conductive aperture 8 therein having an external surface (Fig. 4B); the first and second substrates aligned such that the conductive apertures of each are substantially aligned (Fig. 4B); the conductive apertures ("wells") of the first and second substrates include a conductive metallic (copper) layer thereon ("copper plated 'wells'"; col.8: 14-15); at least one solder member 2 (Figs. 4A,B; col.5: 14-16: AuSn or SnPb; col.5: 62-66; col.8: 14-17) including a first contact portion (i.e., the bottom portion) extending from said external (bottom) surface of conductive aperture 8 (Figs. 4A,B), the first contact portion including a cross-sectional configuration that is substantially oval or ellipsoidal (Figs. 4A,B), and 2), and a second contact portion (i.e., the remaining portion in and beyond conductive aperture 8) substantially within both of the aligned conductive apertures 8 of the first and second circuitized substrates to secure the substrates together (Fig. 4B; col.5: 62-66; col.8: 14-28); the copper material of the conductive apertures 8 of the first and second circuitized substrates including a protective layer of benzotriazole thereon (col.6: 45-55: see table; col.7: 56-58 and 66-68; col.8: 1-3).

As to Claim 27, Bindra et al. further discloses that the first and second circuitized substrates are comprised of polytetrafluoroethylene (PTFE) (col.6: 11-13; col.7: 44-48; col.8: 35-37).

As to Claim 28, Bindra et al. further discloses that the conductive apertures 8 of the first circuitized substrate (Fig. 4A) comprise holes having a cylindrical shape (Fig. 4A).

As to Claims 29 and 30, Bindra et al. further discloses that solder member 2 is comprised of a high melt solder having a melting point temperature greater than about 183°C (liquidus temperature for SnPb eutectic, i.e., 63/37, solder) (col.6: 11-13, col.7: 44, col.8: 14-22 and 35-38).

As to Claim 31, Bindra et al. further discloses that the first (bottom) contact portion of the solder member 2 (Fig. 4A) extending from the external (bottom) surface of the conductive aperture 8 of the first circuitized substrate (Fig. 4A) forms a connection to a printed circuit board 12 (Fig. 4B).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Wang et al. (US 6,026,564) discloses polyimide or epoxy glass cloth substrates 10, 10' and 10'' are joined by solder members 26, wherein at least one aperture 14 in substrate 10 is aligned with other corresponding apertures 14 in the substrates 10' and 10'' forming through-hole aperture 28 (Fig. 4; col.5: 17-25). Chip 36 is mounted on the stacked assembly of substrates 10, 10' and 10'' (Fig. 4) and the stacked assembly is mounted to another substrate or a printed circuit board (col.5: 25-28).

b) Anzawa et al. (US 5,617,300) discloses substrates 10 and 11 joined through aligned apertures 2h and 3h by means of solder H which extends from a bottom surface of the aperture 2h of substrate 10 (Fig. 5; col.5: 15-23).

c) Boggs (US 4,935,584) discloses rigid or flex substrates (col.1: 37-40) in stacked arrangement by means of solder members 50 and 60 that fill the apertures (Fig. 4; col.3: 47-50 and 57-61).

d) Anthony (US 4,394,712) discloses silicon-on-sapphire substrates 30 joined by solder members 26 in plated apertures 20 of the substrates 30 (Figs. 5, 7 and 8; col.5: 38-46).

e) Crepeau (US 4,249,302) discloses a stacked assembly of flexible TEFLON substrates 14, 16 and 18, each having plated apertures 56 therethrough, and a reflowable metal, extending through the apertures and from both surfaces thereof and forming the electrical connections through the aligned apertures 56, as well as the mechanical connections in conjunction with the bolts 44 (Figs. 1 and 2; col.4: 58-65; col.5: 17-23).

f) Casson et al. (US 5,727,310) discloses a stacked assembly of PTFE substrates (col.14: 40-46) and teaches that stacked substrate assemblies (i.e., multilayer boards) formed of flexible substrate material enhance device reliability through the reduction of mechanical stress on the multilayer board by absorbing mechanical shocks during operation (col.16: 1-4 and 8-9; col.17: 24-27).

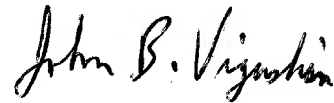
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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Vigushin whose telephone number is 703-308-1205. The examiner can normally be reached on 8:30AM-5:00PM Mo-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7382 for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



John B. Vigushin
Examiner
Art Unit 2827

jbv
September 26, 2002